



SCENARIO		
Title	Arduino - what is a microcontroller and how can it be used?	
Summery	Students will be introduced to the basics of Arduino controllers, learn to connect it to a computer and implement their first program.	
Author/s	Edyta Michaluk Justyna Fidrocka	Date: 30/01/2020

# **Didactic objectives**

General objectives:		
- learning the definitions related to microcontrollers		
- getting to know the composition of the Arduino platform		
Detailed objectives:		
Arduino support		
- the ability to write a program in Arduino		
PhysicsMathematicsInformation TechnologyRoboticsProgramming		
Education Level: $10-12$ years $\square$ $12-14$ years $\square$		
Problem Statement		
How does Arduino work?		
How to configure the platform, connect it to the computer?		
How to create a script in Scratch for Arduino?		
BOM (Bill Of Materials needed)		
- computer station for a group of students (3-4 people)		
- multimedia board with a projector for presentation		
- Internet access		
- Arduino set		
- Arduino IDE software		
Activity description		
The scenario is planned for 3 lessons.		
Course of classes:		
1. Organization in the classroom. Division of students into groups.		
2. Conversation with students about intelligent devices, how they work and what makes machines "think".		
3. Introduction of the term microcontroller. Showing examples of the use of microcontrollers in everyday		
life. Presentation of the Arduino microcontroller.		
4. The structure of the Arduino board. Overview of items.		

5. Connecting boards to computers. After the teacher's instructions, the students should connect the

"InnoExperiment – Innovative Approach to Teaching through Experiment" <u>Project Leader:</u> Zespół Szkolno – Przedszkolny w Goniądzu (ZSP)





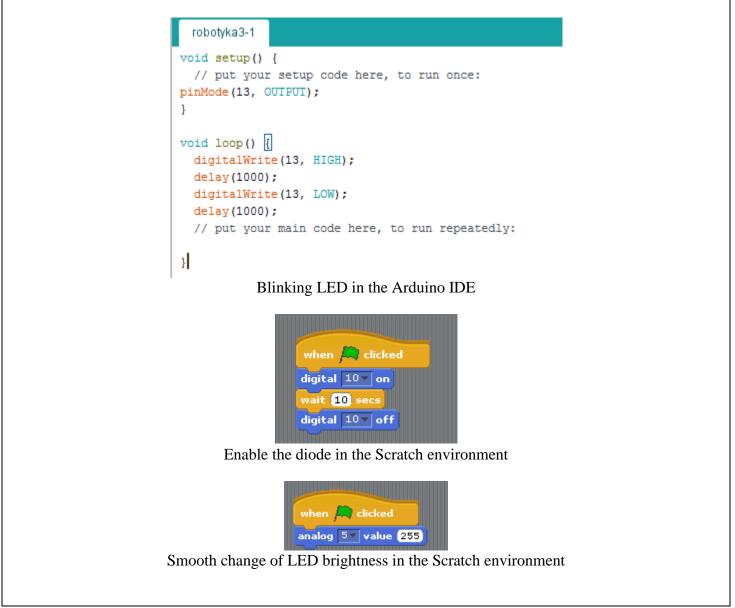




boards by themselves.

- 6. Overview of the basic functions of the Arduino IDE.
- 7. The first program in the Arduino IDE environment Blink (blinking LED). Use of the pinMode, = () digitalWrite (), delay () functions.
- 8. Introduction to the Scratch for Arduino program switching the diode on / off, changing the diode brightness.
- 9. Summary of the classes. Analysis of new skills. Self-evaluation of students.

# Resources



"InnoExperiment – Innovative Approach to Teaching through Experiment" <u>Project Leader:</u> Zespół Szkolno – Przedszkolny w Goniądzu (ZSP)









**Students' Evaluation** 

# **Evaluation tools:**

- observation of students' work and their activities,

- observation of the ability to work in a group,

- students' self-assessment - what I have learned, what I can, what I would like to know, what algorithm I can create,

- program feasibility.

### **Bibliography**

https://www.arduino.cc/

http://forbot.pl/blog/artykuly/programowanie/kurs-arduino-w-robotyce-1-wstepid936 http://s4a.cat/

Scalability

Older students can complete tasks on their own. Task proposal: programming the Arduino diode which will be on for 3 seconds, off for 1 second, on again for 3 seconds, off for 1 second, etc. Younger students are recommended to work in the Scratch environment, while older ones in the Arduino IDE environment ( work on code).

### Moreinformation

Scenario was created as part of the project "InnoExperiment - Innovative Approach to Teaching through Experiment" carried out under Key Action 2. Erasmus +. The scenario will be made available on the project platform.

"InnoExperiment – Innovative Approach to Teaching through Experiment" <u>Project Leader:</u> Zespół Szkolno – Przedszkolny w Goniądzu (ZSP)



